PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
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ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 28 August 2000 (28.08.00)	
International application No. PCT/GB99/04394	**Applicant's or agent's file reference** P005090WO MP
International filing date (day/month/year) 23 December 1999 (23.12.99)	**Priority date** (day/month/year) 30 December 1998 (30.12.98)
Applicant HORNE, David	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

27 July 2000 (27.07.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Zakaria EL KHODARY

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
P005090WO KMB		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB99/04394	23/12/1999	30/12/1998
International Patent Classification (IPC) or national classification and IPC H02B1/30		
Applicant APW ELECTRONICS LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
27/07/2000	12.04.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Torlai, P Telephone No. +49 89 2399 2293

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/04394

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-3	as originally filed	

Claims, No.:

1-9	with telefax of	19/03/2001

Drawings, sheets:

1/4-4/4	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   - ☐ the description, pages:
   - ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-9
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item V

D1: US-A-3 606 020 (KERN WALTER) 20 September 1971 (1971-09-20)
D2: DE 297 09 227 U (KNUERR MECHANIK AG) 31 July 1997 (1997-07-31)
D3: US-A-5 488 543 (MAZURA PAUL ET AL) 30 January 1996 (1996-01-30)
Novelty:
D2 is considered to represent the nearest state of the art for the new claim 1 . It discloses a frame for an electrical cabinet, the frame comprising two transverse members disposed at opposite ends of the frame, and at least two side members connecting opposed sides of the transverse members, wherein each of the transverse members has a skeletal form comprising at least two tubes and/or bars connected together with at least one portion of each of the transverse members having a recess in a substantial part thereof the side members being stepped back from the other sides of the transverse members to define a space therebetween.

The subject-matter of the new independent Claim differs
from the frame described in D2 in that the bars forming the transverse members have substantially the same shape being shaped like a "U" with a substantially straight base and being connected together at the bases thereof by welding or brazing.

For this reason subject-matter of Claim 1 is new in respect of prior art as defined in the regulations (Rule 64(1)-(3) PCT) .

Inventive step
In the frame according to D2 the transverse members are foldable.
This brings advantages for the transportation of the frame however reduces the stability of the frame.
The problem to be solved by the claimed invention can be regarded as to improve the frame known from D2 in order to render the structure more stable.
In the frame according to document D3, the base and lid plates (1, 2) are not of a skeletal form.
In the frame according to document D1 the two bars are not "U" shaped and are connected together by bolts (column 3, lines 18-25). The side members are located at the corners of the frame.
The documents of the available state of the art (international search report) even if

considered together do not suggest a frame as defined in the new claim 1. For these reasons the solution disclosed in claim 1 is not considered to be obvious.

Industrial application
The claimed invention is considered as susceptible of industrial application.

Re Item VII

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1, D2, D3 is not mentioned in the description, nor are these documents identified therein.

Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D2) being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

Re Item VIII

The description has not been brought into conformity with the new claims;
The parts of the description referring to embodiments of the invention that do not fall within the scope of the new claims have not been deleted from the description and drawings.
This inconsistency between the claims and the description leads to a doubt concerning the extent of protection afforded by the claims, thus rendering the claims unclear, contrary to Article 6 PCT. unclear, contrary to Article 6 PCT.

CLAIMS

1. A frame (10) for an electrical cabinet, the frame (10) comprising two transverse members (30) disposed at opposite ends of the frame (10), and at least two side members (20) connecting opposed sides of the transverse members (30), wherein each of the transverse members (30) has a skeletal form formed from two connected substantially "U" shaped bars (32, 34) having substantially the same shape with substantially straight bases, and being connected together at the bases thereof by welding or brazing, with at least one of the other sides of each of the transverse members (30) having a recess in a substantial part thereof, and the side members (20) being stepped back from the other sides of the transverse members (30) to define a space therebetween.

2. A frame for an electrical cabinet according to claim 1, wherein each of the transverse members (30) includes additional bars or tubes (38) connected as strengthening members to the two bars or tubes (36).

3. A frame for an electrical cabinet according to claim 1 or 2, comprising four side members (20).

4. A frame for an electrical cabinet according to claim 3, wherein the four side members (20) comprise four bars or tubes.

5. An electrical cabinet, comprising a frame (10) according to any of the preceding claims, and removable side panels (40).

AMENDED SHEET

6. An electrical cabinet according to claim 5, further comprising at least one removable door (60).

7. An electrical cabinet according to claim 5 or 6, further comprising at least one removable end panel (50).

8. An electrical cabinet according to any of claims 5 to 7, wherein the removable side panels (40) and/or the at least one removable door (60) are removably attached to the side members (20) of the frame (10) by hooks.

9. An electrical cabinet according to any of claims 5 to 8 wherein the removable side panels (40) are mounted on cantilevers extending out from the frame (10).

AMENDED SHEET

PATENT COOPERATION TREATY

PTO/PCT Rec'd 21 JUN 2001

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BODEN, Keith McMurray
D. Young & Co.
21 New Fetter Lane
London EC4A 1DA
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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

	Date of mailing *(day/month/year)* 12.04.2001
Applicant's or agent's file reference P005090WO KMB	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB99/04394	23/12/1999	30/12/1998

Applicant
APW ELECTRONICS LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Ottaviani, P Tel.+49 89 2399-2225

Form PCT/IPEA/416 (July 1992)

CLAIMS

1. A frame (10) of an electrical cabinet, said frame (10) comprising:
two transverse members (30) disposed at opposite ends of the frame (10) and connected together by at least two side members (20), each of the transverse member (30) having a skeletal form comprising at least one tube and/or bar with at least one side of each transverse member (30) having a recess in a substantial part of said at least one side.

2. A frame for an electrical cabinet according to claim 1, wherein each transverse member (30) is formed from two bars or tubes (32, 34, 36) connected together.

3. A frame for an electrical cabinet according to claim 2, wherein the two bars or tubes (32, 34) have substantially the same shape and are connected together at and around half way along their respective lengths.

4. A frame for an electrical cabinet according to claim 2 or claim 3, wherein the two bars or tubes (32, 34) are substantially "U' shaped and are connected together at the bases of the two "U's.

5. A frame for an electrical cabinet according to claim 4, wherein the bases of the substantially "U' shaped bars or tubes (32, 34) are substantially straight.

6. A frame for an electrical cabinet according to any of claims 2 to 5, wherein the two tubes or bars (32, 34) are welded or brazed together.

7. A frame for an electrical cabinet according to claim 2, wherein the bars or tubes (36) form a substantially cross shape.

8. A frame for an electrical cabinet according to claim 7, wherein said cross shape is elongate such that the end portions of one side of said elongate cross is parallel to the other side.

9. A frame for an electrical cabinet according to any of claims 3 to 9, wherein said transverse member (30) includes additional bars or tubes (38) connected as strengthening members to both of said two tubes or bars (36).

10. A frame (10) for an electrical cabinet according to any of the preceding claims, the frame (10) including four of the side members (20).

11. A frame for an electrical cabinet according to claim I0, wherein the four side members (20) comprise four bars or tubes.

12. An electrical cabinet comprising a frame (10) according to any of the preceding claims, the electrical cabinet further comprising removable side panels (40).

13. An electrical cabinet according to claim 12, further comprising at least one removable end panel (50).

14. An electrical cabinet according to claim 12 or 13, further comprising at least one removable door (60).

15. An electrical cabinet according to any one of claims 12, 13, and 14 wherein the removable side panels (40) and/or the at least one removable door (60) are removably attached to the side members (20) of the frame (10) by hooks.

16. An electrical cabinet according to any one of claims 12 to 15, wherein the removable side panels (40) are mounted on cantilevers extending out from the frame (10).

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ENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
P005090WO MP		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/GB 99/ 04394	23/12/1999	30/12/1998
Applicant		
APW ELECTRONICS LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 2

   [X] as suggested by the applicant.

   [ ] None of the figures.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : H02B 1/30 — A1

(11) International Publication Number: WO 00/41283

(43) International Publication Date: 13 July 2000 (13.07.00)

(21) International Application Number: PCT/GB99/04394

(22) International Filing Date: 23 December 1999 (23.12.99)

(30) Priority Data:
9828843.4 30 December 1998 (30.12.98) GB

(71) Applicant *(for all designated States except US)*: APW ELECTRONICS LIMITED [GB/GB]; Electron Way, Chandlers Ford, Eastleigh, Hampshire SO53 4ZR (GB).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: HORNE, David [GB/GB]; 11 Pine Close, South Wonston, Hamphshire S021 3EB (GB).

(74) Agent: PURVIS, William, Michael, Cameron; D. Young & Co., 21 New Fetter Lane, London EC4A 1DA (GB).

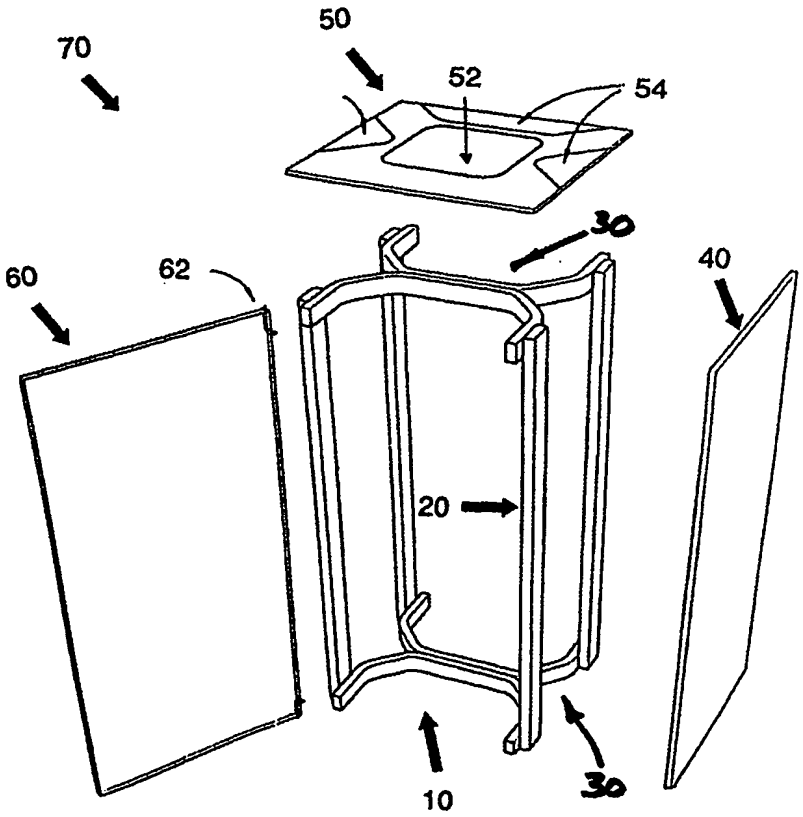
(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: AN ELECTRICAL CABINET AND A FRAME THEREFOR

(57) Abstract

An electrical cabinet (70) and a frame (10) therefor, wherein the frame comprises side members (20) connected together by transverse members (30). Each transverse member (30) is made from bars or tubes in a skeletal form with at least one recess in the side of the transverse member (30). The skeletal form of each transverse member (30) makes it cheap to manufacture and can provide for large recesses, thereby facilitating cable access. The electrical cabinet (70) comprises removable side panels (40) and a door (60) mounted on the frame (10). The frame (10) can also provide mounting points for subracks of electrical or electronic components.



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AN ELECTRICAL CABINET AND A FRAME THEREFOR

This invention relates to frames for electrical cabinets and to electrical cabinets.

Electrical cabinets for receiving electronic and electrical components, are used in connection, for example, with the operation of local data networks. The components, for example, subracks with electronic and electrical components, fans and other accessories are mounted within the cabinets on internal frames. The cabinets generally have side panels, a door and end panels that surround and are mounted on the frame.

These electrical cabinets require access for cables, which are often thick and unwieldy, and also for people to service the appliances. Conventional frames have substantial die-cast end members. One frame of the prior art is designed with end members that have recesses in the sides, these recesses can be used for cable access so that, with the side panels of the cabinet removed, cables do not need to be threaded through access holes. Despite the advantages of side recesses these end members are nevertheless, bulky, expensive to manufacture and the space for the cables is limited.

According to one aspect of the invention there is provided a frame of an electrical cabinet, said frame comprising:

two transverse members disposed at opposite ends of the frame and connected together by at least two side members, each of the transverse member having a skeletal form comprising at least one tube and/or bar with at least one side of each transverse member having a recess in a substantial part of said at least one side.

The device of the present invention overcomes or at least alleviates the problems of the prior art by providing transverse members which are skeletal in form, making them cheap to manufacture. The skeletal form also provides for large recesses which allow good cable access and also enable service personnel to place their feet inside the cabinet giving them better access to the electronic equipment they are servicing. Thus the present invention can provide a frame for an electrical cabinet with improved performance and at approximately two thirds of the price of the frames of the prior art.

Advantageously, the frame has four of the side members. The provision of four side members and transverse members at either end of the frame can provide a robust construction for the frame.

In preferred embodiments, the transverse member is formed from two bars or tubes connected together. Advantageously, these two bars or tubes have the same shape and are

connected at and around points half way along their respective lengths. The use of bars or tubes having substantially the same shape reduces manufacturing costs.

The tubes or bars may, advantageously, be substantially "U" shaped and may be connected together at the bases of the two "U"s. This provides a robust shape from a small amount of material. It also provides large recesses in the sides which are convenient for cable and personnel access.

In some embodiments, the base of the "U" shaped bars or tubes are substantially straight. This arrangement allows for the two bars to be more easily and robustly joined together. This is particularly so if they are welded or brazed together. Welding and brazing provide a convenient, strong and cost effective way of joining the two components.

In an alternative embodiment, the bars or tubes are joined to form a substantially cross shape, preferably an elongate cross shape wherein the end portions of one side of said elongate cross is parallel to the other side. This arrangement also provides for large side recesses.

In some embodiments, the transverse member may comprise further strengthening bars or tubes connected to both of said two tubes or bars.

According to another aspect of the invention, there is provided an electrical cabinet comprising a frame as described above and further comprising removable side panels, end panels and/or doors. Electrical cabinets may require the various components to be interchanged or serviced and therefore the provision of side and end panels that are easily removable is very convenient. Although these panels and doors may be screwed on, in preferred embodiments they are attached to the frame by hooks thereby facilitating their removal.

Although the side panels may be mounted directly to the frame, in some embodiments they are mounted on cantilevers extending out from the frame. This arrangement allows for extra space at the sides of the cabinet.

Embodiments of the present invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 illustrates a frame according to an embodiment of the present invention;

Figure 2 illustrates the frame of Figure 1 with associated side and end panels and a quick-release door;

Figure 3 illustrates a portion of an electrical cabinet according to another embodiment of the present invention;

Figure 4 illustrates a transverse member for a frame according to an embodiment of the present invention.

Figure 1 illustrates a frame according to an embodiment of the present invention. The frame 10 comprises tubular side members 20, connected together by two tubular transverse members 30 at either end of the side members. The tubular transverse members comprise two straight based "U" shaped tubes 32, 34 welded together. Although in preferred embodiments the transverse member is comprised of tubular members welded together it may alternatively be formed of bars, and the two pieces may be crimped or screwed together.

Figure 2, illustrates side panels 40, an end panel 50 and a removable door 60 that are mounted on the frame of Figure 1 to form an electrical cabinet. The removable door is mounted via hooks 62 in holes (not shown) on the side members 20 of the frame 10, thereby forming a quick-release fitting. The end panel 50, has a ventilation hole 52, and cable access recesses 54. Electrical cabinets typically have a width of 19" (approximately 48cm). They are often mounted on wheels (not shown) for ease of movement.

Figure 3 illustrates a view of a portion of an electrical cabinet 70 according to an embodiment of the present invention. This electrical cabinet 70 has no end member. Electrical cabinets that are the same height as the room in which they are located, with cabling coming down from the ceiling, are often used, such electrical cabinets generally have no end members. In this embodiment the side panels 40 have ventilation holes. The side members 20 of the end frame comprise holes 22 which receive hooks attached to elements to be mounted in the electrical cabinet.

Figure 4, illustrates an alternative embodiment of the transverse member 30 of the frame. This member is formed of two main bars or tubular members 36 welded together to form an elongate cross shape. Additional strengthening bars or tubes 38 may be used to support the structure. Although it is preferred to weld or braze the two portions together they may also be attached by crimping, or by screw attachments.

CLAIMS

1. A frame (10) of an electrical cabinet, said frame (10) comprising:
two transverse members (30) disposed at opposite ends of the frame (10) and connected together by at least two side members (20), each of the transverse member (30) having a skeletal form comprising at least one tube and/or bar with at least one side of each transverse member (30) having a recess in a substantial part of said at least one side.

2. A frame for an electrical cabinet according to claim 1, wherein each transverse member (30) is formed from two bars or tubes (32, 34, 36) connected together.

3. A frame for an electrical cabinet according to claim 2, wherein the two bars or tubes (32, 34) have substantially the same shape and are connected together at and around half way along their respective lengths.

4. A frame for an electrical cabinet according to claim 2 or claim 3, wherein the two bars or tubes (32, 34) are substantially "U' shaped and are connected together at the bases of the two "U's.

5. A frame for an electrical cabinet according to claim 4, wherein the bases of the substantially "U' shaped bars or tubes (32, 34) are substantially straight.

6. A frame for an electrical cabinet according to any of claims 2 to 5, wherein the two tubes or bars (32, 34) are welded or brazed together.

7. A frame for an electrical cabinet according to claim 2, wherein the bars or tubes (36) form a substantially cross shape.

8. A frame for an electrical cabinet according to claim 7, wherein said cross shape is elongate such that the end portions of one side of said elongate cross is parallel to the other side.

9. A frame for an electrical cabinet according to any of claims 3 to 9, wherein said transverse member (30) includes additional bars or tubes (38) connected as strengthening members to both of said two tubes or bars (36).

10. A frame (10) for an electrical cabinet according to any of the preceding claims, the frame (10) including four of the side members (20).

11. A frame for an electrical cabinet according to claim I0, wherein the four side members (20) comprise four bars or tubes.

12. An electrical cabinet comprising a frame (10) according to any of the preceding claims, the electrical cabinet further comprising removable side panels (40).

13. An electrical cabinet according to claim 12, further comprising at least one removable end panel (50).

14. An electrical cabinet according to claim 12 or 13, further comprising at least one removable door (60).

15. An electrical cabinet according to any one of claims 12, 13, and 14 wherein the removable side panels (40) and/or the at least one removable door (60) are removably attached to the side members (20) of the frame (10) by hooks.

16. An electrical cabinet according to any one of claims 12 to 15, wherein the removable side panels (40) are mounted on cantilevers extending out from the frame (10).

FIGURE 1

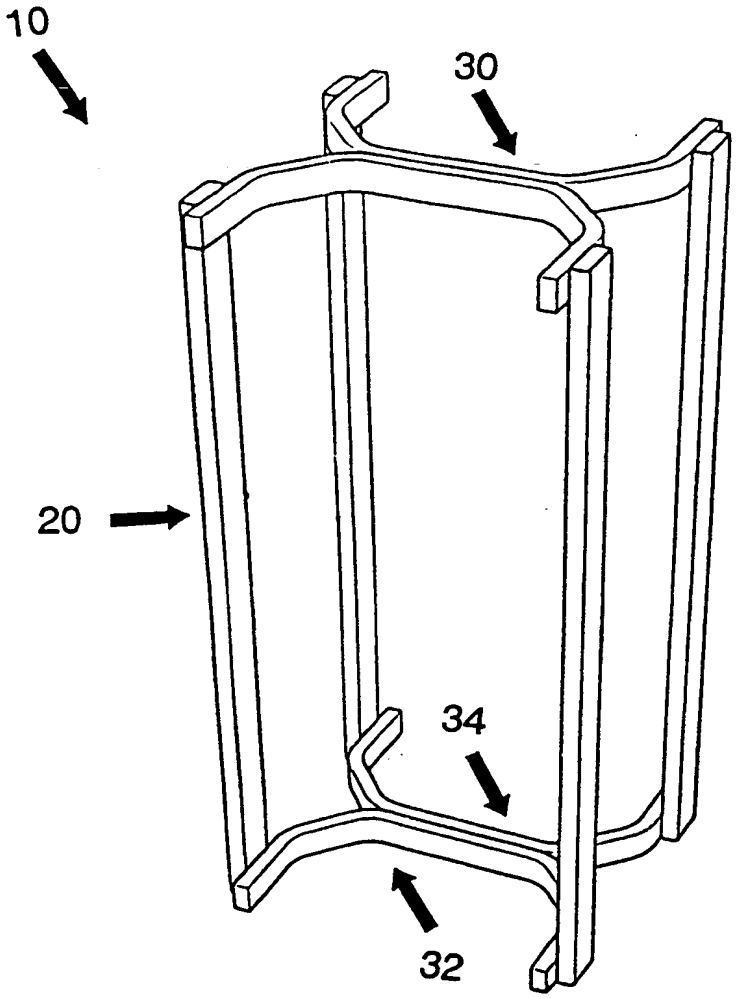


FIGURE 2

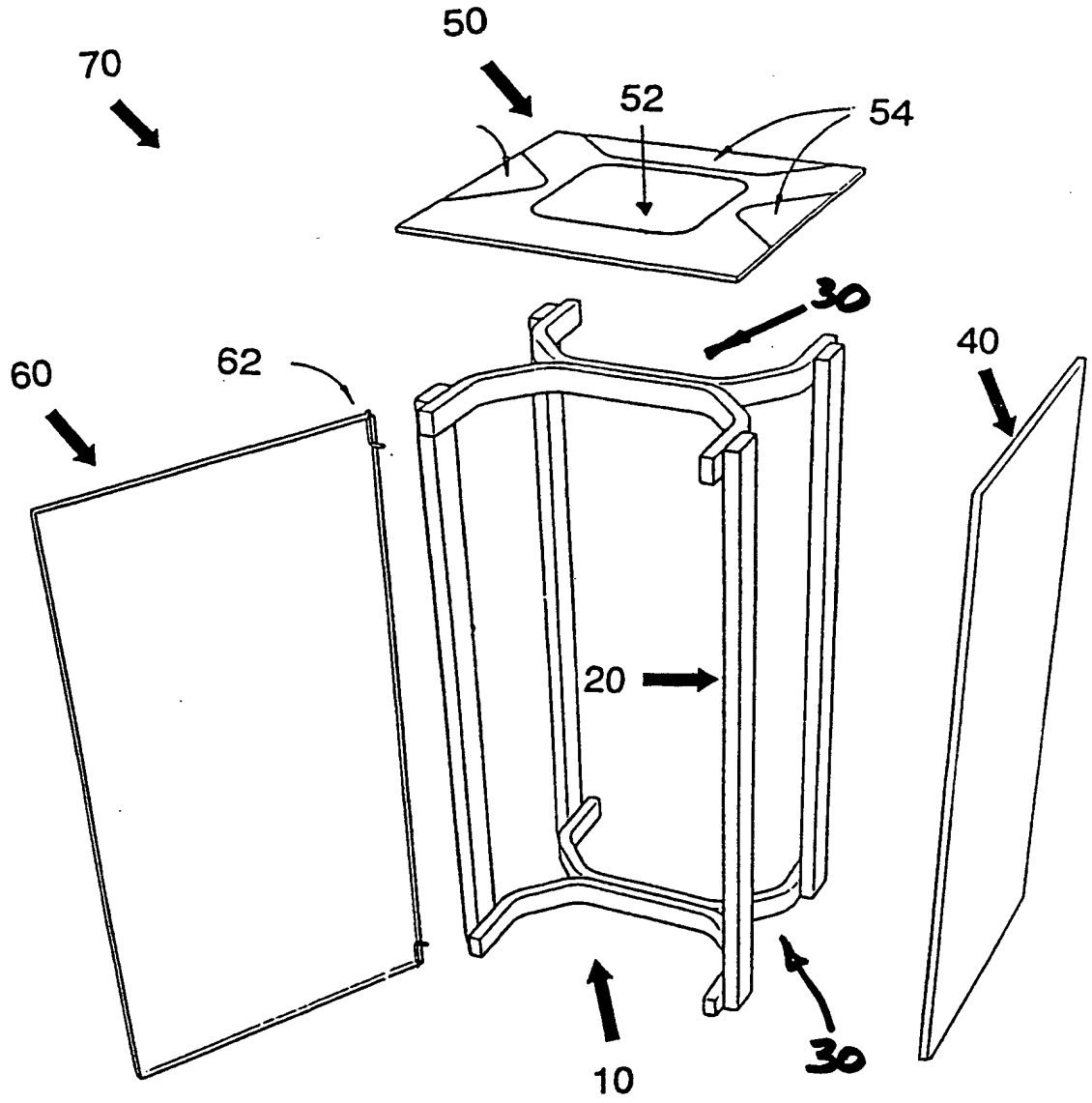


FIGURE 3

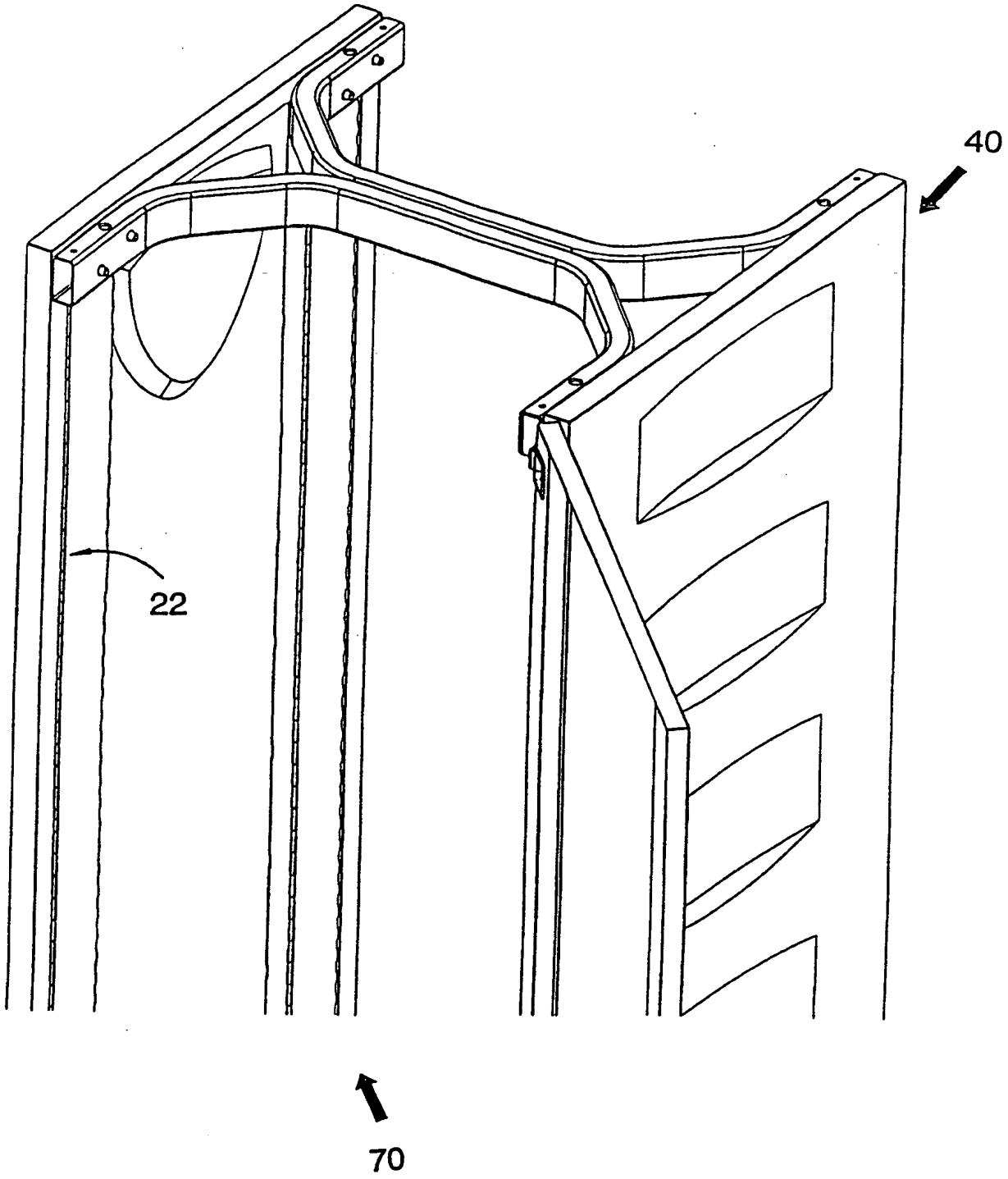
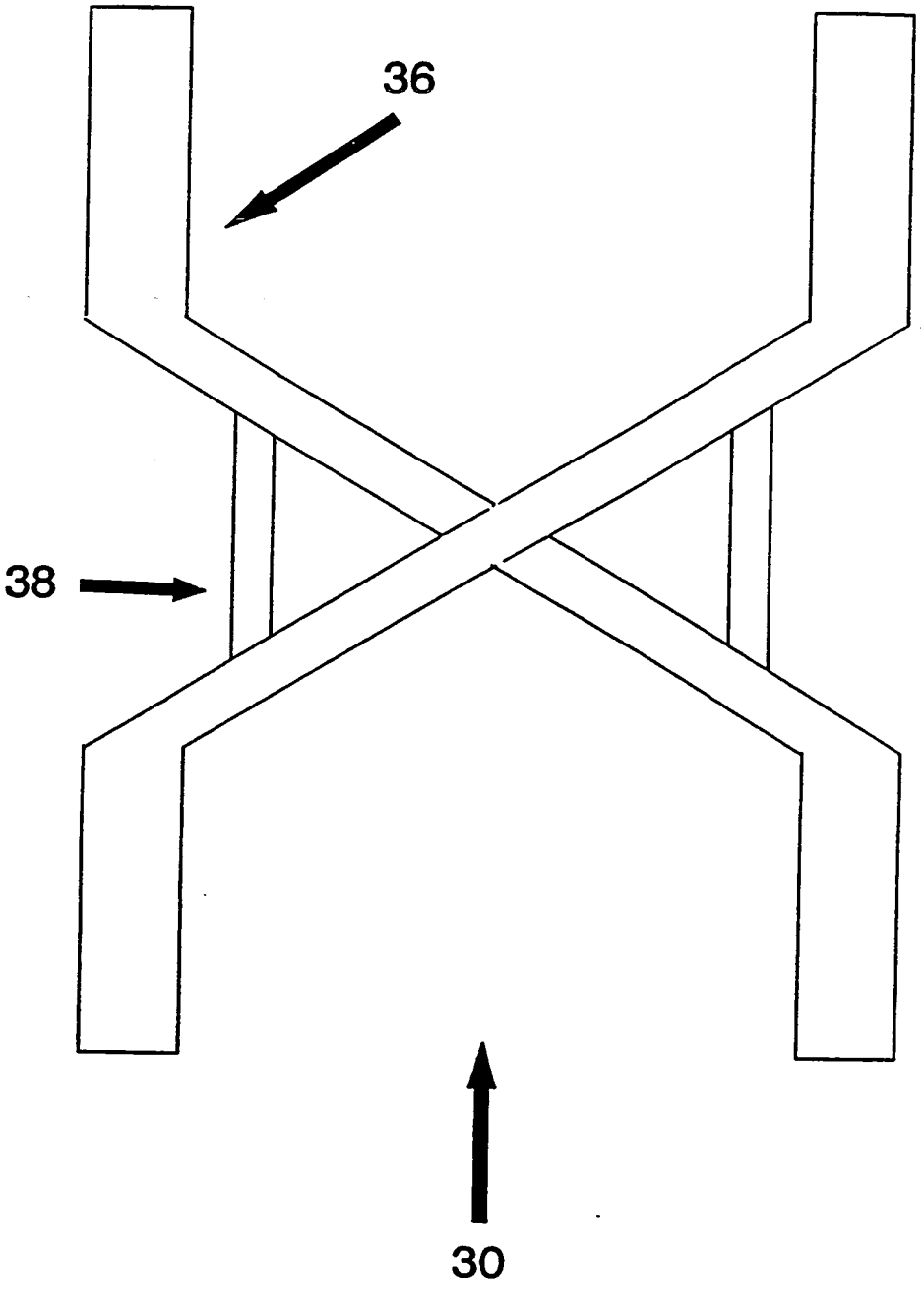


FIGURE 4



INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 99/04394

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H02B1/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H02B H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	the whole document	2,7
X	US 5 488 543 A (MAZURA PAUL ET AL) 30 January 1996 (1996-01-30) the whole document	1,10-14
A	US 3 606 020 A (KERN WALTER) 20 September 1971 (1971-09-20) abstract	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search	Date of mailing of the international search report
29 February 2000	06/03/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Dailloux, C

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INTERNATIONAL SEARCH REPORT

information on patent family members

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